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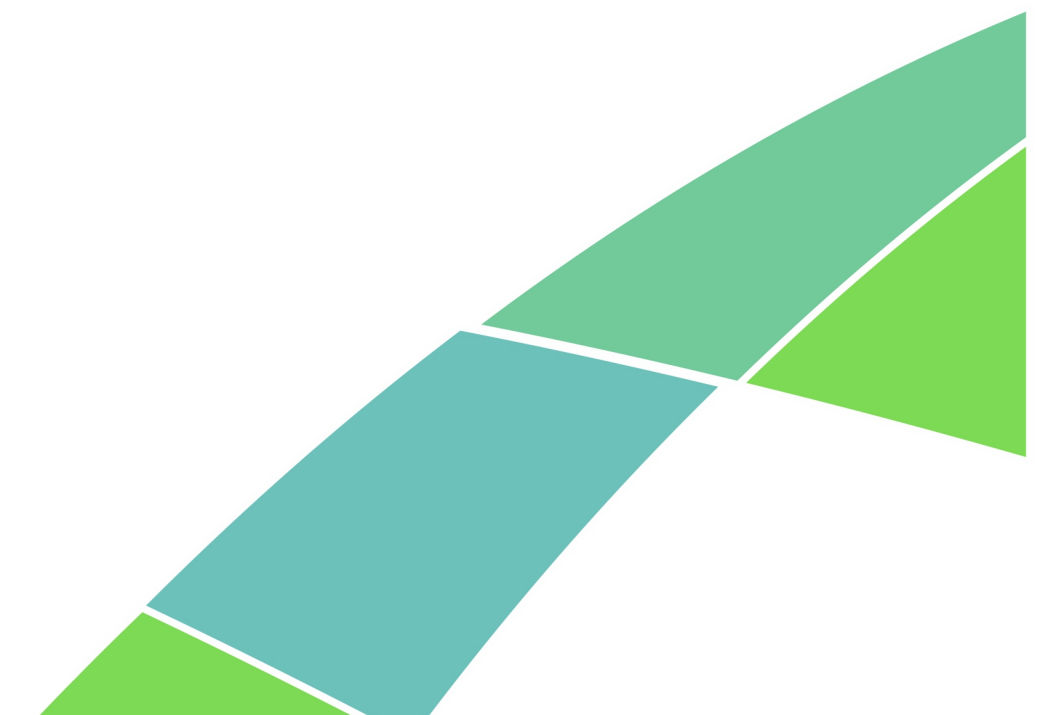
# **REVIEW, EVALUATION AND OPTIMISATION OF THE SOUTH AFRICAN WATER RESOURCES MONITORING NETWORK**

**Network Inventory**

**VOLUME 2: MAP BOOK**

**DRAFT**

**MARCH 2015**





Obtainable from

Chief Directorate: Water Information Management

Department: Water and Sanitation

Private Bag X313

PRETORIA

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## PREFACE

*The Department of Water and Sanitation (DWS) is the custodian of ten national monitoring programmes. The overall aim of this project is to undertake an evaluation of each monitoring network, in its present condition, and to redesign and re-align the network based on scientific analysis and the strategic and management objectives of DWS and of the country as a whole. The water resources monitoring network will be optimised to ensure sustainable, relevant and up-to-date data of an acceptable quality*

*This Network Inventory Task focussed on the production of maps to illustrate the spatial distribution of the existing monitoring stations for these ten monitoring programmes. The deliverable from this Network Inventory task, together the User Requirements Task will be used to identify shortcomings in the current networks.*

*The metadata from each of the ten monitoring networks was analysed and descriptive labels were developed for each station to describe the temporal information (record period), open/closed, completeness, etc.*

*This task was undertaken by a team of specialists, one for each of the following categories of data:*

- *Surface water quantity.*
- *Surface water quality.*
- *Groundwater levels and quality.*
- *Biophysical Data*
- *Hydro-meteorology*

*This was followed by the development of five thematic maps with information on the spatial distribution of these ten monitoring points per new Water Management Area (WMA) have been compiled. Even though other institutions in South Africa are also collecting surface water, groundwater, Hydro-meteorological, water quality, eco-health, mostly for their own interests and applications, only the Hydro-meteorological networks of ARC and SAWS data were included on these maps since these data are used daily by DWS. Due to an abundance of groundwater stations in a number of WMA's, station numbers, rather than the detailed developed labels, were adopted for labelling the groundwater maps. The detailed groundwater labels are included as Appendix A.*

*The thematic Maps produced per nine WMA's are as follows:*

*A2-size maps were developed for the nine new WMAs per data category, as follows:*

- 1) *Limpopo WMA*
- 2) *Olifants WMA*
- 3) *Inkomati-Usuthu WMA*
- 4) *Pongola-Mtamvuna WMA*
- 5) *Vaal WMA*
- 6) *Orange WMA*
- 7) *Mzimvubu-Tsitskamma WMA*
- 8) *Breede-Gouritz WMA*
- 9) *Berg-Olifants WMA.*

*Other products developed as part of this Task are data catalogues and Google Earth KMZ-coverages which are very useful to the DWS, external users and to the project team during the new network design.*

*Subsequent to the completion of the Network Inventory and User Requirements tasks, the Data integrity assessment task will continue to determine the quality of the available data.*



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Appendix A

Detailed Groundwater Level and Quality Monitoring Station Labels

**WMA 2:**

**Olifants**



Legend

Surface Water Quantity Stations

River Flow

Dam Volume

Canal Flows

Groundwater Eyes

Tidal

Closed

Rivers

Dams

Primary Catchment Boundaries

Secondary Catchment Boundaries

Quaternary Catchment Boundaries

Water Management Area

Mean Annual Runoff

0 - 2.5 mm

2.5 - 5 mm

5 - 10 mm

10 - 20 mm

20 - 50 mm

50 - 100 mm

100 - 200 mm

200 - 500 mm

> 500 mm

LABEL KEY

Station Number

Parameter measured

Number of years with unflagged daily data

Status: O = Open  
C996 = Closed (since 1996)

DT : 1945 = Latest DT date  
NoDT = No DT

% Gap in daily record

Parameters:

R = River stage data only  
Rf = River flow (DT Present)  
Pf = Pipe flow

C = Canal stage data only  
Cf = Canal flow (DT Present)  
G = Stage data from GW Eyes  
Gf = Flow from GW Eyes

D = Reservoir levels data  
Dv = Reservoir volume (survey present)  
B = Dam balance done  
T = Tidal stage data

Project Title:	Review, Evaluation and Optimisation of the South African Water Resources Monitoring Network		Scale 1:1 300 000 (When page size is: A2 landscape)	Figure 2.1		
Map Title:	WMA 2 - Olifants: Surface Water Quantity Monitoring Stations		Projection: Geographic Datum: Hartebeesthoek 1994			
			Compiled By: LC Gallagher GIS QC By: M Storie - PGP 0124 Approved By: E van Niekerk Date Saved: 2015/03/16 Project Number: 60326707 Map Ref: SW_Quantity_Olifants_A2L.mxd Revision: 01	Sources: DWS: Water Information Management Water Resources of South Africa 2005 (WRC)		
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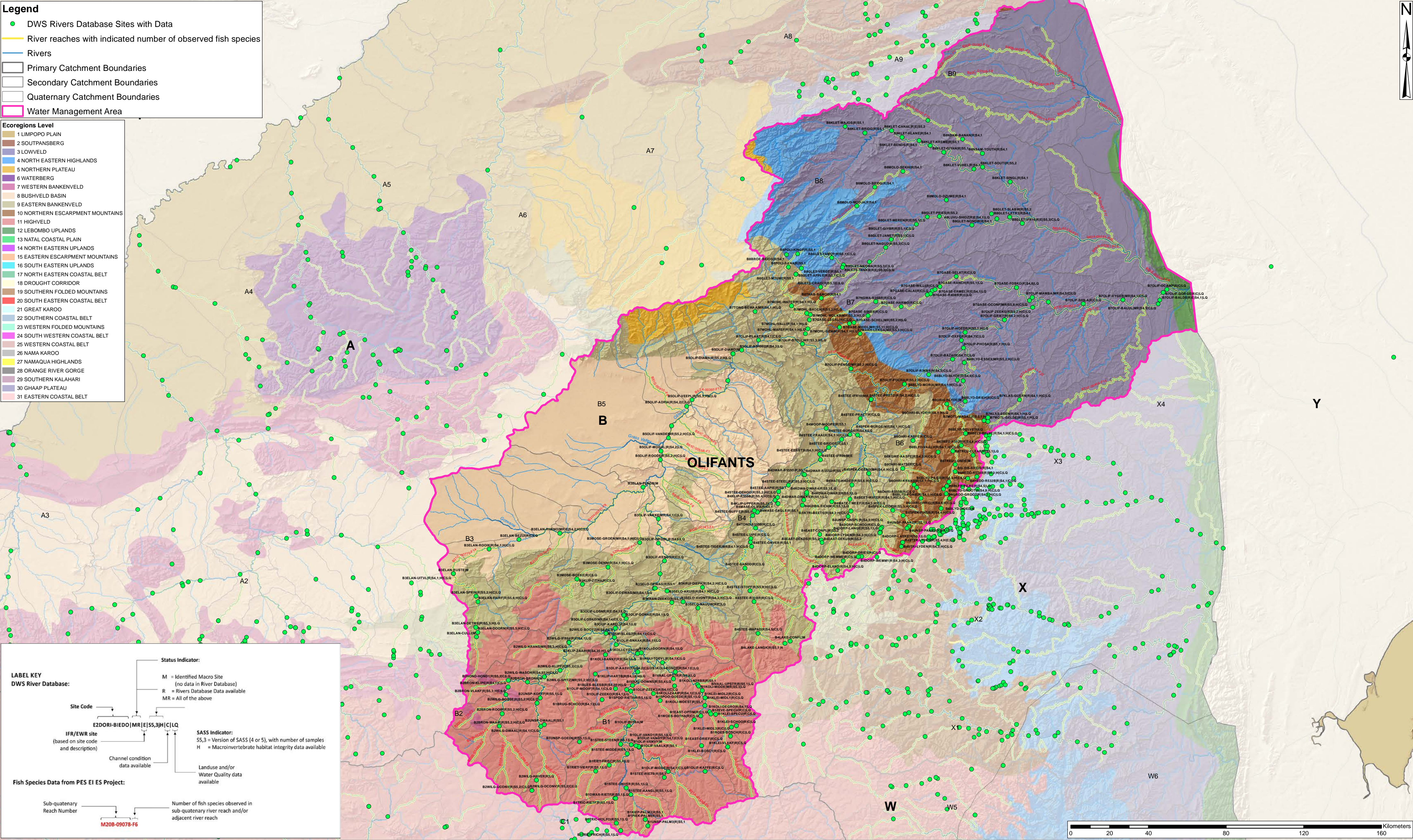







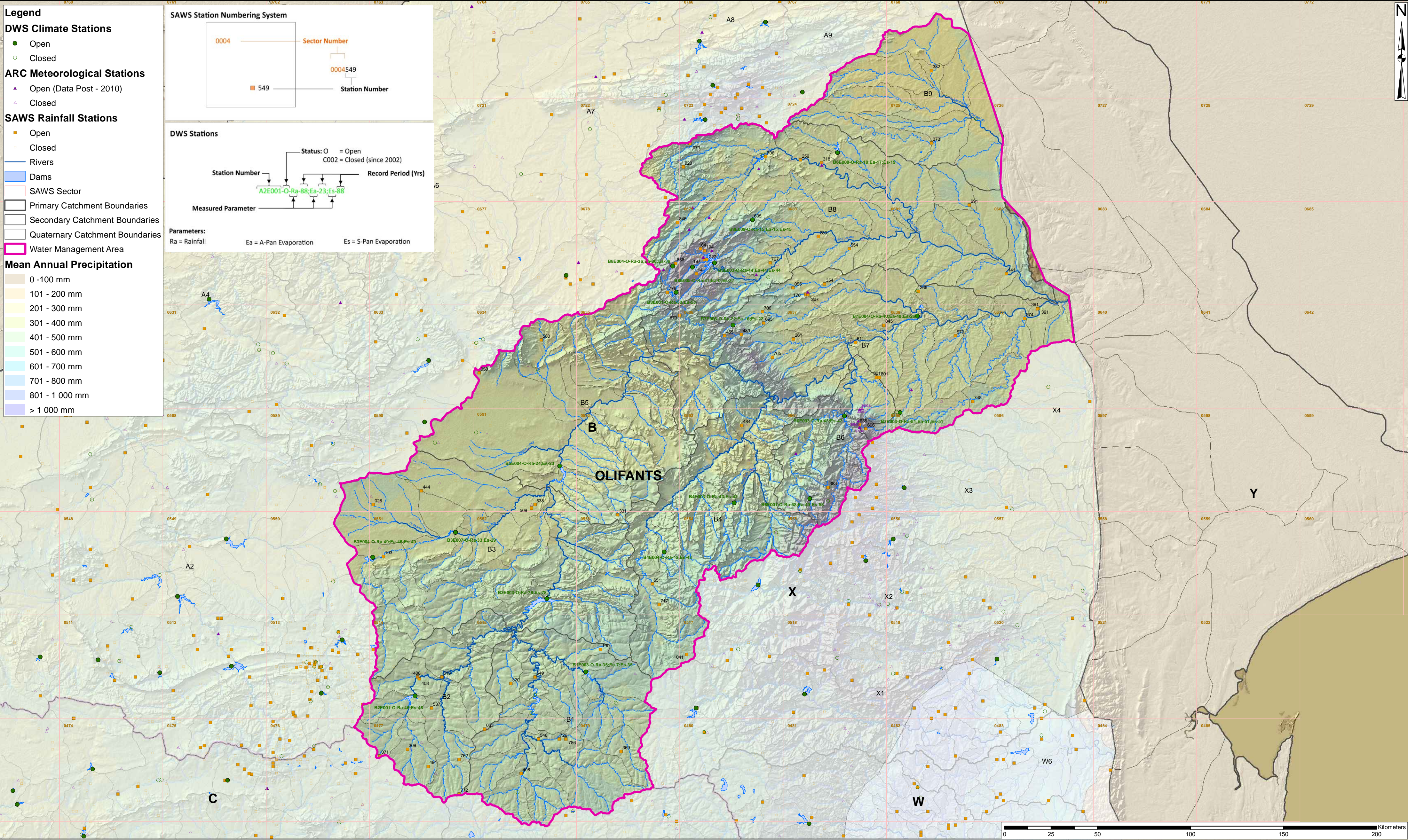







Project Title:	Review, Evaluation and Optimisation of the South African Water Resources Monitoring Network		Scale 1:1 250 000 (When page size is: A2 landscape)	Figure 2.4
Map Title:	WMA 2 - Olifants: Biophysical Monitoring Stations		Projection: Geographic Datum: Hartebeesthoek 1994	
			Compiled By: LC Gallagher GIS QC By: M Storie - PGP 0124 Approved By: E van Niekerk Date Saved: 2015/03/17 Project Number: 60326707 Map Ref: Biophysical_Olifants_A2L.mxd Revision: 01	Sources: DWS: Water Information Management Water Resources of South Africa 2005 (WRC) Desktop PES, EI + ES (DWS, 2014)
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Map Title: <b>WMA 2 - Olifants: Hydro-meteorological Monitoring Stations</b>		Projection: Geographic Datum: Hartebeesthoek 1994		
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**APPENDIX A:**  
**Detailed Groundwater Level and Quality**  
**Monitoring Station Labels**

**WMA 2: Olifants**



WMA 2 - Olifants: Groundwater Level and Quality Monitoring Stations

Station	Name	Catchment	Province	Label
A9N0009	Hoyandou ptn. Tshidzivhe	A92A	LP	A9N0009-GI-O-8yrs-4%
B5N0011	Portugal	B51G	LP	B5N0011-GI-O-46yrs-2%
B5N0013	Modderfontein	B51G	LP	B5N0013-GI-O-46yrs-2%
C3N0666	Grootkop ptn. Seswikaneng	C33C	NC	C3N0666-GI-O-1yrs-0%
B7N0002	Okkernootboom	B73E	MP	B7N0002-GI-O-11yrs-0%
B6N0001	Clermont ptn Matibidi ptn. Mamorapama	B60D	MP	B6N0001-GI-O-2yrs-0%
B3N0027	Klippan ptn. Mmamethlake	B31E	MP	B3N0027-GI-O-2yrs-0%
B3N0001	Knapp	B31E	LP	B3N0001-GI-O-47yrs-1%
B3N0012	Tuinplaats	B31E	LP	B3N0012-GI-O-38yrs-1%
B3N0023	Knapp ptn. Settlers	B31E	LP	B3N0023-GI-O-3yrs-0%
B3N0022	De Kuil	B31E	LP	B3N0022-GI-O-7yrs-10%
B4N0002	RIETFontein	B41E	LP	B4N0002-GI-O-2yrs-0%
B3N0025	Walkraal ptn. Siyabuswa	B31H	MP	B3N0025-GI-O-2yrs-0%
B3N0024	Kwarrielaagte ptn. Ntwane	B32H	MP	B3N0024-GI-O-2yrs-0%
B3N0026	Kameelpoortnet ptn. Klipkopfontein	B31D	MP	B3N0026-GI-O-2yrs-0%
B3N0019	Hartebeestfontein Ptn. Rayton 092044 Plot 11	B31A	GP	B3N0019-GI-O-10yrs-0%
B3N0020	Hartebeestfontein Ptn. Rayton 092044 Plot 9	B31A	GP	B3N0020-GI-O-10yrs-0%
B3N0021	Zonkolol Ptn. Rayton Nkululeko Bricks	B31A	GP	B3N0021-GI-O-10yrs-0%
B1N0006	Leeuwpoot	B11K	MP	B1N0006-GI-O-0yrs-0%
B1N0008	Middelburgtown and Townlands	B12D	MP	B1N0008-GI-O-0yrs-0%
A2N0755	Onbekend ptn. Welbekend	A21	GP	A2N0755-GI-O-20yrs-0%
B2N0021	Rietfontein	B20	GP	B2N0021-GI-O-29yrs-0%
B2N0031	Rietvalei	B20	GP	B2N0031-GI-O-27yrs-0%
B2N0032	Rietvalei	B20	GP	B2N0032-GI-O-27yrs-0%
B2N0034	Rietvalei	B20	GP	B2N0034-GI-O-27yrs-0%
B2N0037	Rietvalei	B20	GP	B2N0037-GI-O-27yrs-0%
B2N0038	Rietvalei	B20	GP	B2N0038-GI-O-27yrs-0%
B2N0039	Rietvalei	B20	GP	B2N0039-GI-O-27yrs-0%
B2N0050	Olifantsfontein	B20	GP	B2N0050-GI-O-29yrs-0%
B2N0051	Rietkol	B20	GP	B2N0051-GI-O-30yrs-0%
B2N0061	Rietvalei	B20	GP	B2N0061-GI-O-29yrs-0%
B2N0063	Rietvalei	B20	GP	B2N0063-GI-O-27yrs-0%
B2N0001	Dorpsgebied (Delmas)	B20	GP	B2N0001-GI-O-47yrs-0%
B2N0003	Delmas Dorpsgebied	B20	GP	B2N0003-GI-O-37yrs-0%
B2N0053	Rietkol	B20	GP	B2N0053-GI-O-28yrs-0%
B2N0055	Leeuwpoot	B20	GP	B2N0055-GI-O-29yrs-0%
B2N0069	Witklip	B20	GP	B2N0069-GI-O-29yrs-0%
B2N0073	Wolvenfontein	B20	GP	B2N0073-GI-O-28yrs-0%
B2N0506	Delmas Dorpsgebied	B20	GP	B2N0506-GI-O-29yrs-0%
B2N0719	Middelbult	B20A	GP	B2N0719-GI-O-9yrs-0%
B2N0720	Middelbult Ptn. E10h	B20A	GP	B2N0720-GI-O-8yrs-0%
B2N0721	Leeuwpoot	B20A	GP	B2N0721-GI-O-9yrs-0%
B1N0005	Graspan	B11A	MP	B1N0005-GI-O-0yrs-0%
B1N0007	Rietkuil	B11B	MP	B1N0007-GI-O-0yrs-0%
B1N0003	Vaalkop	B11C	MP	B1N0003-GI-O-0yrs-0%
B9N0004	Mhingas Location Extension	B90B	LP	B9N0004-GI-O-9yrs-21%
B9N0001	Lith Ptn. Greenfam	B90C	LP	B9N0001-GI-O-9yrs-20%
B9N0002	Locatie Van De Knopneuzen Ptn. Mukhomi	B90F	LP	B9N0002-GI-O-9yrs-9%
B9N0003	Jorrison ptn. Halahala	B90F	LP	B9N0003-GI-O-9yrs-3%
B8N0503	Stateland Ptn. Vuheli	B82H	LP	B8N0503-GI-O-9yrs-8%
B8N0521	Midelfontein ptn. Chavani	B82F	LP	B8N0521-GI-O-9yrs-5%
B8N0504	Stateland Ptn. Ka-Sikhunyane	B82G	LP	B8N0504-GI-O-8yrs-3%
B8N0507	Stateland Ptn. Ka-Nghalalume	B82G	LP	B8N0507-GI-O-6yrs-4%
B8N0524	Doornhoek ptn. Mmumoni	B82E	LP	B8N0524-GI-O-0yrs-0%
B8N0509	Caledon Ptn. Ndengeza	B82D	LP	B8N0509-GI-O-9yrs-4%
B8N0510	Paardedood	B82D	LP	B8N0510-GI-O-8yrs-10%
B8N0515	Worcester Ptn. Femane	B81G	LP	B8N0515-GI-O-8yrs-19%
B8N0520	Segops Location Ptn. Sekgopo	B82A	LP	B8N0520-GI-O-9yrs-20%
B8N0523	SILWANAS PTN. NYAKALANE	B81J	LP	B8N0523-GI-O-4yrs-21%
B8N0518	State Land	B81F	LP	B8N0518-GI-O-9yrs-12%
B8N0514	Doornhoek Ptn. Tzaneen	B81B	LP	B8N0514-GI-O-8yrs-10%
B8N0502	Haenertsburg Town And Townlands Ptn. Haenersburg	B81A	LP	B8N0502-GI-O-6yrs-9%
B7N0006	Schalk Ptn. Namakgale	B72K	LP	B7N0006-GI-O-9yrs-6%
B7N0007	Rubbervale Ptn. Rubbervale Station	B72J	LP	B7N0007-GI-O-8yrs-28%

WMA 2 - Olifants: Groundwater Level and Quality Monitoring Stations

Station	Name	Catchment	Province	Label
B5N0054	Zamensloop Ptn. Dithlophaneng	B52H	LP	B5N0054-GI-O-8yrs-15%
B5N0068	Spitskop	B52H	LP	B5N0068-GI-O-7yrs-13%
B8N0513	Mohlabas Location Ptn. Nkoakoa	B81D	LP	B8N0513-GI-O-8yrs-18%
B7N0005	Bordeaux Ptn. Julesburg	B72E	LP	B7N0005-GI-O-7yrs-13%
B7N0013	Paardevlei	B71A	LP	B7N0013-GI-O-7yrs-16%
B7N0011	Mica	B72D	LP	B7N0011-GI-O-9yrs-13%
B5N0052	Langkrans Ptn. Ga-Chuene	B52C	LP	B5N0052-GI-O-8yrs-5%
B7N0014	Moelijelik ptn. Tshebeng	B71B	LP	B7N0014-GI-O-2yrs-17%
B7N0004	Bismark	B72A	LP	B7N0004-GI-O-8yrs-37%
B7N0015	State land ptn. Penge	B71F	LP	B7N0015-GI-O-5yrs-0%
B5N0051	Wildebeestpan	B51E	LP	B5N0051-GI-O-7yrs-10%
B5N0055	Byzonderheid Ptn. Roedtan	B51E	LP	B5N0055-GI-O-7yrs-8%
B5N0056	KROKODILKOP PTN. ELANDSKRAAL	B51E	LP	B5N0056-GI-O-4yrs-0%
B5N0069	Klipput	B51E	LP	B5N0069-GI-O-28yrs-6%
B7N0009	The Oaks Ptn. The Willows	B71H	LP	B7N0009-GI-O-8yrs-8%
B5N0067	Korenvelden geluks Location	B52B	LP	B5N0067-GI-O-4yrs-0%
B5N0057	Rustplaats ptn. Maololo	B51H	LP	B5N0057-GI-O-4yrs-0%
B5N0058	Rustplaats ptn. Mmatsekele	B51H	LP	B5N0058-GI-O-3yrs-0%